

Application Serial No.: 09/778,392
Amendment dated July 6, 2004

Docket No.: ECV-5620

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) A system for performing a surgical procedure within a blood vessel, comprising:
 - at least one guidewire, said guidewire inserted into a body vessel;
 - an antegrade probe having a distal portion, said antegrade probe comprising at least one antegrade guidewire lumen, said antegrade guidewire lumen terminating in at least one antegrade guidewire port;
 - a retrograde probe having a distal portion, said retrograde probe comprising at least one retrograde guidewire lumen, said retrograde guidewire lumen terminating in at least one retrograde guidewire port, said at least one retrograde guidewire port co-aligned with said antegrade probe, the retrograde probe distal portion positioned adjacent the antegrade probe distal portion; and
 - at least one of said antegrade probe and said retrograde probe further comprising at least one lumen in addition to said retrograde and antegrade guidewire lumens.
2. (Original) The system of claim 1, wherein said antegrade probe and said retrograde probe are placed over said guidewire so that said guidewire resides within said at least one antegrade guidewire port and said at least one retrograde guidewire port and wherein said at least one retrograde guidewire port is co-aligned with said at least one antegrade guidewire port.
3. (Original) The system of claim 1, further comprising a second guidewire and wherein said antegrade probe comprises a first antegrade guidewire lumen terminating in a first antegrade guidewire port and a second antegrade guidewire lumen terminating in a

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terminates in at least one vacuum port at said distal portion of said retrograde probe, thereby enabling the grasping and manipulation of tissue.

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19. (Original) The system of claim 18, wherein said tissue fastener is a needle and suture.

20. (Original) A system of claim 1, wherein at least one of said antegrade probe distal portion and said retrograde probe distal portion disposes at least one deployable alignment mechanism.

21. (Original) A deployable alignment mechanism of claim 20, comprising:
at least two alignment arms flexibly attached to the distal portion of at least one of said antegrade probe and said retrograde probe;

a deployment conduit operably connected to said at least two alignment arms;

said deployment conduit attached to a deployment actuator;

said at least two alignment arms having a retracted position wherein said arms are located proximal to the distal portion of at least one of said antegrade probe and said retrograde probe;

said at least two alignment arms having a deployed position wherein said arms are extended radially from said distal portion of at least one of said antegrade probe and said retrograde probe; and

said retracted and deployed positions achieved through manipulation of said deployment actuator.

22. (Original) The system of claim 21, wherein said at least one lumen comprises an alignment mechanism deployment lumen.

23. (Currently amended) The system of claim 1, wherein at least one of said antegrade probe and retrograde probe have sufficient length, steerability and maneuverability to reach [[the]] tissue within the blood vessel from a peripheral insertion site.

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24. (Original) The peripheral insertion site of claim 23, wherein the peripheral insertion site is the femoral artery.

25. (Original) The peripheral insertion site of claim 23, wherein the peripheral insertion site is the brachial artery.

26. (Original) The system of claim 1, further comprising a steering mechanism located proximate to said distal portion of at least one of said antegrade probe and said retrograde probe.

27. (Original) The steering mechanism of claim 26, further comprising a steering conduit attached to said distal portion of at least one of said antegrade probe and said retrograde probe, said steering conduit in communication with an operator through one of said at least one antegrade lumen and said at least one retrograde lumen.

28. (Original) The system of claim 1, further comprising at least one echogenic member at or near the distal portion of one of said antegrade probe and said retrograde probe to enhance echo visualization.

29. (Original) The system of claim 1, further comprising a polymer coating which can be wholly or selectively applied at or near the distal portion of one of said antegrade probe and said retrograde probe to enhance echo visualization.

30. (Currently amended) A system for repairing tissue, comprising:
at least one guidewire, said guidewire inserted into a body vessel;
an antegrade probe having a distal portion, said antegrade probe comprising at least one antegrade guidewire lumen, said antegrade guidewire lumen terminating in at least one guidewire port, the antegrade probe distal portion positioned adjacent an antegrade side of the tissue;

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a retrograde probe having a distal portion, said retrograde probe comprising at least one retrograde guidewire lumen, said retrograde guidewire lumen terminating in at least one guidewire port, said at least one retrograde guidewire port co-aligned with said antegrade probe, the retrograde probe distal portion positioned adjacent a retrograde side of the tissue and adjacent the antegrade probe distal portion; and

at least one of said antegrade probe and said retrograde probe further comprising at least one vacuum lumen.

31. (Previously presented) A system for repairing tissue, comprising:

at least one guidewire, said guidewire inserted into a body vessel;

an antegrade probe having a distal portion, said antegrade probe comprising at least one antegrade guidewire lumen, said antegrade guidewire lumen terminating in at least one guidewire port;

a retrograde probe having a distal portion, said retrograde probe comprising at least one retrograde guidewire lumen, said retrograde guidewire lumen terminating in at least one guidewire port, said at least one retrograde guidewire port positioned radially about said retrograde distal portion substantially parallel to the longitudinal axis of said retrograde probe and co-aligned with said antegrade probe;

at least one of said antegrade probe and said retrograde probe further comprising at least one vacuum lumen; and

at least one tissue fastener at the distal end of either said retrograde probe or said antegrade probe.

32. (Original) The tissue fastener of claim 31, wherein said tissue fastener is a suture-based tissue fastener.

33. (Original) The tissue fastener of claim 31, wherein said tissue fastener is a clip.

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34. (Original) The tissue fastener of claim 31, wherein said tissue fastener is a staple.

35. (Original) The system of claim 31, wherein the other one of said antegrade probe and retrograde probe further includes a tissue fastener receiver, said receiver providing cooperative stabilization of tissue while affixing said tissue fastener.

36. (Previously presented) A system for repairing tissue, comprising:
at least one guidewire, said guidewire inserted into a body vessel;
an antegrade probe having a distal portion, said antegrade probe comprising at least one antegrade guidewire lumen, said antegrade guidewire lumen terminating in at least one guidewire port;
a retrograde probe having a distal portion, said retrograde probe comprising at least one retrograde guidewire lumen, said retrograde guidewire lumen terminating in at least one guidewire port, said at least one retrograde guidewire port co-aligned with said antegrade probe;
at least one of said antegrade probe and said retrograde probe further comprising at least one vacuum lumen; and
a steering mechanism located proximate to said distal portion of at least one of said antegrade probe and said retrograde probe.

37. (Original) The steering mechanism of claim 36, further comprising a steering conduit attached to said distal portion of at least one of said antegrade probe and said retrograde probe, said steering conduit in communication with an operator through one of said at least one antegrade lumen and said at least one retrograde lumen.

38. (Currently amended) A method of stabilizing tissue, comprising:
delivering an antegrade probe to a position antegrade to the tissue;
delivering a retrograde probe to a position retrograde to the tissue;

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aligning said ~~first~~ antegrade probe and said ~~second~~ retrograde probe longitudinally;

using one or more of said ~~first~~ antegrade and said ~~second~~ retrograde probes to stabilize the tissue; and

using one or more of said ~~first~~ antegrade and said ~~second~~ retrograde probes to fasten the tissue.

39. (Original) The method of claim 38 wherein said antegrade probe and said retrograde probe are used simultaneously to provide cooperative support to the tissue interposed therebetween.

40. (Previously presented) The method of claim 38, wherein the tissue is in a patient, and all of the steps of the method are completed without arresting a heart of the patient.

41. (Previously presented) The method of claim 38, further comprising the steps of:

delivering a guidewire through an entry point and passing said guidewire through the venous system and the into the left atrium;

using said guidewire to pierce the atrial septum and bringing said guidewire through the mitral valve to the right ventricle, exiting the heart through the aortic valve and aorta, and exiting the body through an exit point;

advancing said antegrade probe over said guidewire through the entry point and delivering said antegrade probe antegrade to the mitral valve; and

advancing said retrograde probe over said guidewire through the exit point and delivering said retrograde probe retrograde to the mitral valve.

42. (Original) The method of claim 38 further comprising the step of aligning said antegrade probe and said retrograde probe to interact with and to provide stabilizing support to the tissue.

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43. (Original) The method of claim 38, further comprising manipulating at least one of the leaflets of the mitral valve disposed proximate to at least one of said antegrade probe and said retrograde probe.

44. (Original) The method of claim 38, wherein said tissue is mitral valve leaflet tissue.

45. (Currently amended) The method of claim 38, wherein one or more of said ~~first~~ antegrade and said ~~second~~ retrograde probes utilizes a suture-based fastener to fasten the tissue.

46. (Currently amended) The method of claim 38, wherein one or more of said ~~first~~ antegrade and said ~~second~~ retrograde probes utilizes a clip to fasten the tissue.

47. (Currently amended) The method of claim 38, wherein one or more of said ~~first~~ antegrade and said ~~second~~ retrograde probes utilizes a staple to fasten the tissue.

48. (Original) The method of claim 38, wherein at least one of said antegrade probe and said retrograde probe is delivered through a femoral artery.

49. (Original) The method of claim 38 wherein at least one of said antegrade probe and said retrograde probe is delivered through a brachial artery.

50. (Original) The method of claim 38, wherein the tissue comprises arterial septal tissue.

51. (Original) The method of claim 38, wherein the tissue comprises ventricular septal tissue.

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52. (Original) The method of claim 38, wherein the tissue comprises a patent foramen ovale.